

ABSTRACT

Disclosed are a spectrofluorimetrically detectable luminescent composition and processes for enhancing the luminescence of one or more lanthanide-containing macrocycles. The luminescent composition comprises a micelle-producing amount of at least one surfactant, at least one energy transfer acceptor lanthanide element macrocycle compound having an emission spectrum peak in the range from 500 to 950 nanometers, and a luminescence-enhancing amount of at least one energy transfer donor compound of yttrium or a 3-valent lanthanide element having atomic number 59-71, provided that the lanthanide element of said macrocycle compound and the lanthanide element of said energy transfer donor compound are not identical. The addition of gadolinium(III) in the presence of other solutes to both the prototype and the di-functionalized europium, samarium, and terbium macrocyclic complexes, which were taught in our U.S. patents #5,373,093 and #5,696,240, enhances their luminescence. Similar enhancements of luminescence also results for the mono-functionalized europium, samarium, and terbium macrocyclic complexes, which were taught in our U.S. patent #5,696,240. The enhanced luminescence afforded by the composition enables the detection and/or quantitation of many analytes in low concentrations without the use of expensive, complicated time-gated detection systems.

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